



## Chapter 2: General Description of the Study Corridor

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### 2.1 Selection of the Study Corridor

Increased oil and gas mining in the Uintah Basin has resulted in an increase in truck traffic along US 40. Increased truck volumes have changed the traffic conditions on US 40, especially between the eastern limits of Heber City in Wasatch County and the town of Jensen in Uintah County. Lands that are adjacent to or are accessed by this stretch of highway are targets for drilling and exploration for oil and gas.

UDOT selected the section of US 40 between MP 21 and MP 157 for study primarily because of the changing traffic conditions. This section of US 40 differs from the sections to the east and west.

- West of the study corridor and MP 21, US 40 travels through the fast-growing Heber City–Midway area. Although this highway segment is somewhat rural, it is close to urban areas, including the Salt Lake and Utah Valleys, so it would be better addressed in a separate study that focuses on the needs of a more urban corridor.
- The eastern project terminus, at State Route (SR) 149 near the town of Jensen, was selected based on traffic patterns. Most traffic, including that related to oil and gas development and well operations, accesses US 40 west of this point. Although there is some pass-through traffic that continues east on US 40 into Colorado, the bulk of the traffic that affects the function of the road on this section of US 40 originates from major connecting roads, such as SR 88 between Roosevelt and Vernal.

### 2.2 Environmental Setting

The study corridor passes through a variety of natural environments. The corridor begins at the mouth of Daniels Canyon in Wasatch County at about 5,900 feet above mean sea level. After traveling up the canyon to Daniels Summit (7,900 feet elevation), the highway drops into the Strawberry Valley on the western edge of the Uintah Basin. The basin, which is a large, elongate, bowl-shaped landform, generally ranges between 5,000 and 5,500 feet in elevation (U.S. Army Corps of Engineers Topographic and Engineering Center 2006). East of Strawberry Reservoir, elevations along the highway continue to decline and level

out at about 5,500 feet near Duchesne. The elevation of the corridor generally remains between about 5,100 feet and 5,300 feet between Duchesne and Vernal. East of Vernal, the elevation drops to about 4,700 feet to the Green River.

The following sections summarize the natural environment along the corridor. Detailed information about the environmental setting of the US 40 study corridor is available in the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a).

## 2.2.1 Geology and Soils

### 2.2.1.1 Geology

In general, the geologic formations along US 40 are relatively simple. The study corridor passes through a number of poorly understood Quaternary fault systems but is dominated by the Uintah Basin landform. The study corridor begins in a transition area of rock that dates from the older Mississippian period (in and around Heber City) to younger Quaternary rock (in the mountains between Heber City and Strawberry Valley). The transition area is defined in part by a portion of the Round Valley Fault System, which consists of northwest-to east-trending normal faults bounding the northeastern and southwestern margins of Round Valley. This fault system currently has no sense of movement, and the most recent significant activity probably occurred in the middle and late Quaternary period.

Moving east, the geology transitions from Quaternary to older Tertiary rock in the Strawberry Valley. This area is defined by the Strawberry Fault System. These faults, which are prominently expressed on the surface and in bedrock, are east-west-trending normal faults and show no sense of movement. The most recent significant movement probably occurred in the Quaternary period.

Once the corridor enters the Strawberry Valley, it is in the Uintah Basin. The geology of the basin is dominated by Eocene rock and younger alluvium and colluvium formed during the Tertiary period. The structural axis of the Uintah Basin trends east-west and is about 10 miles north of the topographic low (followed by the Duchesne River). The highway corridor follows sections of younger Quaternary rock that are associated with the Duchesne River between the cities of Duchesne and Roosevelt. Quaternary rock also occurs around Vernal and near the eastern terminus near the Green River.

The corridor passes near the southern limit of an additional small fault, the Stinking Springs Fault, east of the Strawberry Fault System but still on the western edge of the basin north of the highway. This north-trending fault has no



sense of movement; the most recent movement probably occurred in the late Quaternary period. The Duchesne–Pleasant Valley Fault System, which consists of suspected Quaternary faults, occurs southeast of Duchesne and south of US 40.

Specific areas along US 40 could exhibit instability (such as localized landslides); these local conditions are not discussed in this report. Though the geologic conditions along US 40 appear to be generally stable, planning for and construction of individual improvement projects would require more detailed geotechnical investigations.

### **2.2.1.2 Soils**

Soil surveys from the Natural Resources Conservation Service (NRCS) were used to obtain information about the soils along US 40, but these surveys cover only part of the study corridor. The *Soil Survey of Heber Valley Area, Utah – Parts of Wasatch and Utah Counties* (USDA SCS 1976) contains information about soils between the western terminus of the project and about the top of Daniels Summit (project Segment 1). The *Soil Survey of Uintah Area, Utah – Parts of Daggett, Grand, and Uintah Counties* (NRCS 2003) includes information about soils between the Duchesne County–Uintah County line and the eastern project terminus in Jensen (project Segments 6 through 8). Land between Daniels Summit and the Duchesne County–Uintah County line was surveyed in the 1920s and 1950s, but reports of the resulting soils data are not available.

Table 2.2-1 below summarizes the available data on soil types along the corridor that are classified as hydric, prime farmland, or farmland of statewide importance (that is, special-status soils). The types, or map units, are generally presented as they occur from west to east. A complete list of soils found along the corridor can be found in the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a). The special-status soils listed in Table 2.2-1 are indicators of conditions that would require special consideration during the planning for future highway improvement projects.

**Table 2.2-1. Special-Status Soils along the Study Corridor**

Soil Map Unit Name (Identifier)	Location and Characteristic(s)
Holmes gravelly loam (Hr)	<ul style="list-style-type: none"> <li>Along highway low in Daniels Canyon</li> <li>Farmland of statewide importance</li> </ul>
Kovich loam, deep water table variant (Km)	<ul style="list-style-type: none"> <li>Along Daniels Creek low in Daniels Canyon</li> <li>Farmland of statewide importance</li> <li>Hydric</li> </ul>
Clegg loam, 3–6% slopes (CgB)	<ul style="list-style-type: none"> <li>Along highway and a tributary stream low in Daniels Canyon</li> <li>Prime farmland if irrigated</li> </ul>
Clegg loam, 6–15% slopes (CgC)	<ul style="list-style-type: none"> <li>Along highway low in Daniels Canyon</li> <li>Farmland of statewide importance</li> </ul>
Fluventic Haploborolls (FA)	<ul style="list-style-type: none"> <li>Along highway and Daniels Creek in Daniels Canyon</li> <li>Hydric</li> </ul>
Sessions clay loam, 5–15% slopes (SEC)	<ul style="list-style-type: none"> <li>Along highway in Daniels Canyon</li> <li>Hydric</li> </ul>
Turzo-Umbo complex, 0–4% slopes (243)	<ul style="list-style-type: none"> <li>Ballard/Fort Duchesne and Vernal/Naples areas of Uintah County</li> <li>Hydric</li> <li>Prime farmland if irrigated</li> </ul>
Stygee clay loam, 0–1% slopes (221)	<ul style="list-style-type: none"> <li>Ballard area, western Uintah County and east of Fort Duchesne</li> <li>Prime farmland if irrigated</li> </ul>
Umbo silty clay loam, 0–2% slopes (252)	<ul style="list-style-type: none"> <li>Ballard area, western Uintah County</li> <li>Hydric</li> </ul>
Ohtog-Parohtog complex, 0–2% slopes (166)	<ul style="list-style-type: none"> <li>Scattered locations between Duchesne County–Uintah County line and Vernal</li> <li>Prime farmland if irrigated</li> </ul>
Ohtog-Parohtog complex, 2–4% slopes (167)	<ul style="list-style-type: none"> <li>Ballard area, western Uintah County</li> <li>Prime farmland if irrigated</li> </ul>
Shotnick-Walkup complex, 0–2% slopes (209)	<ul style="list-style-type: none"> <li>Ballard area, western Uintah County and east of Fort Duchesne</li> <li>Prime farmland if irrigated</li> </ul>
Greybull-Utaline-Badland complex, 8–50% slopes (94)	<ul style="list-style-type: none"> <li>Ballard and Naples/Jensen areas of Uintah County</li> <li>Hydric</li> </ul>
Blackston loam, 0–2% slopes (23)	<ul style="list-style-type: none"> <li>Fort Duchesne and Naples/Jensen areas of Uintah County</li> <li>Prime farmland if irrigated</li> </ul>
Boreham loam, 0–2% slopes (27)	<ul style="list-style-type: none"> <li>Fort Duchesne area, western Uintah County; Vernal/Naples area of Uintah County</li> <li>Prime farmland if irrigated</li> </ul>
Blackston loam, 2–4% slopes (24)	<ul style="list-style-type: none"> <li>Fort Duchesne and Naples areas of Uintah County</li> <li>Prime farmland if irrigated</li> </ul>
Nakoy loamy fine sand, 1–5% slopes (160)	<ul style="list-style-type: none"> <li>Fort Duchesne area, western Uintah County</li> <li>Prime farmland if irrigated</li> </ul>

**Table 2.2-1. Special-Status Soils along the Study Corridor**

Soil Map Unit Name (Identifier)	Location and Characteristic(s)
Robido-Uver complex, 1–4% slopes (192)	<ul style="list-style-type: none"> <li>• Along Uinta River near Fort Duchesne</li> <li>• Hydric</li> </ul>
Yarts fine sandy loam, 2–4% slopes (280)	<ul style="list-style-type: none"> <li>• Along sand washes between Fort Duchesne and Vernal</li> <li>• Prime farmland if irrigated</li> </ul>
Turzo-Umbo complex, 2–4% slopes (244)	<ul style="list-style-type: none"> <li>• Vernal area of Uintah County</li> <li>• Prime farmland if irrigated</li> </ul>
Green River loam, 0–2% slopes, rarely flooded (89)	<ul style="list-style-type: none"> <li>• Vernal/Naples area of Uintah County</li> <li>• Hydric</li> </ul>
Shotnick sandy loam, 2–4% slopes (206)	<ul style="list-style-type: none"> <li>• Vernal/Naples area of Uintah County</li> <li>• Prime farmland if irrigated</li> </ul>
Nolava-Nolava, wet complex, 0–2% slopes (162)	<ul style="list-style-type: none"> <li>• Vernal/Naples/Jensen area of Uintah County</li> <li>• Prime farmland if irrigated</li> </ul>
Nolava-Nolava, wet complex, 2–4% slopes (163)	<ul style="list-style-type: none"> <li>• Vernal/Naples/Jensen area of Uintah County</li> <li>• Prime farmland if irrigated</li> </ul>
Umbo clay loam, 0–2% slopes (251)	<ul style="list-style-type: none"> <li>• Vernal/Naples/Jensen area of Uintah County</li> <li>• Hydric</li> </ul>
Wyasket loam, 0–2% slopes (275)	<ul style="list-style-type: none"> <li>• Naples/Jensen area of Uintah County</li> <li>• Hydric</li> </ul>
Wyasket loam, 2–4% slopes (276)	<ul style="list-style-type: none"> <li>• Naples/Jensen area of Uintah County</li> <li>• Hydric</li> </ul>

Source: NRCS 2007

## 2.2.2 Water Resources

### 2.2.2.1 Surface Water

US 40 crosses a total of 150 non-wetland water features along the 136-mile study corridor: 80 intermittent streams, rivers, or washes; 33 perennial streams or rivers; 36 canals, ditches, or aqueducts; and an arm of one reservoir (Starvation Reservoir). These features, many of which are unnamed, are tributaries of two major systems: (1) the Utah Lake system (USGS cataloging unit 16020201) on the west side of Daniels Summit, and (2) the Lower Green-Diamond system (USGS cataloging unit 1406001) on the east side of Daniels Summit (that is, the Uintah Basin). See the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a) for a complete list of features crossed by the US 40 study corridor.

Water features on the west side of Daniels Summit drain to Utah Lake via the Provo River system. Some water is pumped from Strawberry Reservoir, which

naturally drains to the Green River system, to Diamond Fork Creek, and ultimately to the Spanish Fork River and Utah Lake. This pumping is part of the Central Utah Project (CUP) system.

The major Green River/Uintah Basin tributaries along the corridor are the Strawberry, Duchesne, and Uinta Rivers. The *Utah State Water Plan – Uintah Basin Plan* (Utah Division of Water Resources 1999) describes minimum in-stream flows for these river systems. Maintaining minimum flows is important for preserving healthy aquatic ecosystems and regional quality of life. By far, the largest use of surface water resources in the Uintah Basin is for agricultural production (Utah Division of Water Resources 1999).

## Wetlands

The project team’s reconnaissance-level survey of the corridor for sensitive resources did not include formal delineations of wetlands or other waters of the United States. The wetland assessments described here and in the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a) were based on observations by a qualified biologist.

Daniels Canyon, a narrow riparian canyon that supports the western-flowing Daniels Creek, supports some riparian wetlands. The area from Daniels Pass east to Strawberry Reservoir is dominated by the Strawberry River and supports wetland complexes associated with the Strawberry Basin. Wetlands are scattered along the highway between Strawberry Reservoir and the city of Duchesne, and two stretches of highway west of Duchesne have several wetland complexes. The area between Antelope Creek and Myton is primarily characterized by wet meadow complexes, saline meadows, and wetlands associated with drainages that cross under the highway. Between Myton and the eastern terminus of the project near Jensen, the wetlands are primarily emergent marshes and wetlands associated with drainages, with a few small wet meadows.

## Water Quality

Surface water resources provide a number of beneficial uses to communities along US 40. These beneficial-use categories include public water supply, recreation, agriculture, and fish and wildlife protection and propagation. Consistent with Section 303(d) of the Clean Water Act, the U.S. Environmental Protection Agency (EPA) assesses and monitors the quality of the nation’s surface water resources to ensure that water resources are being managed in a way that protects beneficial uses. EPA oversees the monitoring and documentation of water bodies that it has identified as “impaired” by pollutants



with the intent of improving water quality (that is, removing the impairment). The State of Utah also defines beneficial uses for many water bodies and assesses and monitors water bodies that are impaired with respect to their beneficial uses.

Table 2.2-2 lists the impaired water bodies that have been inventoried and that occur along or cross the US 40 study corridor.

A number of potential pollution sources are present along the US 40 corridor. These include, but are not limited to, agricultural activities, mining, and urban runoff.

**Table 2.2-2. Impaired Water Bodies along the Study Corridor**

Water Body	Location	Impairment	County
<i>Segment 1</i>			
None	–	–	–
<i>Segment 2</i>			
Strawberry Reservoir	Strawberry Valley	Organic enrichment, low dissolved oxygen	Wasatch
Starvation Reservoir	Just west of Duchesne	Organic enrichment, low dissolved oxygen	Duchesne
<i>Segment 3</i>			
None	–	–	–
<i>Segment 4</i>			
Antelope Creek	Near Bridgeland	Salinity, total dissolved solids (TDS), chlorides	Duchesne
Duchesne River	Near Myton	Salinity, TDS, chlorides	Duchesne
<i>Segment 5</i>			
Dry Gulch Creek and tributaries	Near Roosevelt	Salinity, TDS, chlorides	Duchesne
<i>Segment 6</i>			
Dry Gulch Creek and tributaries	Near Ballard and Fort Duchesne	Salinity, TDS, chlorides	Uintah
Uinta River	Near Fort Duchesne	Salinity, TDS, chlorides; habitat alterations	Uintah
<i>Segment 7</i>			
None	–	–	–
<i>Segment 8</i>			
Ashley Creek	Between Naples and Jensen	Salinity, TDS, chlorides; metals	Uintah

Source: EPA 2004



## Floodplains

Floodplains are land areas adjacent to rivers and streams that are at risk of periodic flooding. Flood insurance rate maps (FIRMs) produced by the Federal Emergency Management Agency (FEMA) define the federally regulated boundaries of floodplains along rivers and streams. The FIRMs are part of FEMA's regulating authority under the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Some state and local governments also conduct mapping, but typically local jurisdictions rely on floodplain information provided by FEMA.

Not all rivers and streams have been mapped by FEMA. For the US 40 corridor, FEMA has produced FIRMs for most areas of Wasatch and Uintah Counties and for the cities of Duchesne and Myton in Duchesne County. The FIRMs do not provide floodplain information for tribal land or for USFS land.

Table 2.2-3 below lists the FEMA Zone A floodplains that occur along or that cross US 40 within the study area. Zone A floodplains are those areas that are likely to be inundated by a 100-year flood (one that has a 1% chance of occurring in any given year).



**Table 2.2-3. Zone A Floodplains along the Study Corridor**

River, Creek, or Canal	Approximate Milepost(s)	County
<i>Segment 1</i>		
Daniels Creek	21–26 (USFS boundary)	Wasatch
<i>Segment 2</i>		
Strawberry River	36.5	Wasatch
Co-op Creek	40–41	Wasatch
Cow Creek	45	Wasatch
Soldier Creek	50.5	Wasatch
Deep Creek	57–59 <sup>b</sup>	Wasatch
Currant Creek	58–59 <sup>b</sup>	Wasatch
<i>Segment 3<sup>a</sup></i>		
Duchesne River	87	Duchesne
<i>Segment 4</i>		
Duchesne River	105	Duchesne
<i>Segment 5</i>		
None	–	–
<i>Segment 6</i>		
Montes Creek	119	Uintah
Uinta River	122	Uintah
Sand Wash	130	Uintah
Halfway Hollow Creek	131	Uintah
Twelvemile Wash	134–138	Uintah
<i>Segment 7</i>		
Steinaker Service Canal	143	Uintah
Ashley Central Canal	143	Uintah
Ashley Canal	147	Uintah
<i>Segment 8</i>		
Tributary to Ashley Creek	149	Uintah
Tributary to Ashley Creek	151	Uintah
Tributary to Ashley Creek	154	Uintah
Ashley Creek	154	Uintah

Sources: FEMA 1977, 1983, 1988a, 1988b

<sup>a</sup> FEMA has not mapped Starvation Reservoir, which crosses US 40 at about MP 82.

<sup>b</sup> Mapped to Wasatch County–Duchesne County line only.

### 2.2.2.2 Groundwater

Groundwater hydrology has been extensively studied in the Uintah Basin. EPA describes the groundwater hydrology as controlled primarily by the region's geologic structure, with permeability variations resulting from differences of lithology and facies (rocks distinguished from others by appearance or composition) as well as widespread faulting and fracturing of the rocks (EPA 2004).

Most of the project area overlies the Uinta-Animas Aquifer, a unit of the greater Colorado Basin Aquifer system. The Uinta-Animas Aquifer is further divided into three sub-basins: the Uintah Basin, the Piceance Basin, and the San Juan Basin. The project area overlies the Uintah Basin sub-basin.

Groundwater recharge in the Uintah Basin is divided among infiltration of precipitation (95.2%), infiltration of irrigation water (3.2%), and return flow from wells and springs (1.6%). About 80% of the groundwater recharge takes place in the basin's northern half; this is because more precipitation is available to enhance groundwater recharge in the Uintah Mountains than is available to the much lower upland areas at the southern edge of the basin (Utah Division of Water Resources 1999). The center of the Uintah Basin, which US 40 crosses, is an area that probably contributes to some groundwater recharge, particularly in irrigated areas.

## 2.2.3 Biological Resources

### 2.2.3.1 Typical Wildlife and Habitat

***Daniels Canyon.*** The study corridor passes through a number of habitat types. The area along the corridor through Daniels Canyon is dominated by sagebrush/grass, mountain brush, aspen, Douglas fir, lodgepole pine, white fir, spruce/fir, and forb (non-grass) communities. Big-game species that inhabit the area include elk, moose, black bear, cougar, and mule deer. Small mammals include cottontail rabbit and snowshoe hare. Two species of forest grouse use the area, and the whooping crane, which is listed as endangered in Utah under the federal Endangered Species Act, migrates through the area (USFS 2001; USFWS 2007).

***Uintah Basin.*** The remainder of the corridor, which passes through the center of the Uintah Basin, is dominated by pinyon-juniper woodland, salt desert scrub, desert shrub, agriculture, and disturbed habitats.



Wildlife species present in the Uintah Basin are those typical of high, cold deserts. Mammals include white-tailed prairie dog, black-tailed jackrabbit, coyote, beaver, red fox, porcupine, spotted skunk, and Townsend's big-eared bat (USFS 1994). The basin is year-round range for deer and antelope and winter range for elk.

The basin provides habitat for many bird species. The dominant desert shrub habitat is used by burrowing owls, short-eared owls, ferruginous hawks, sage sparrows, lark sparrows, western meadowlarks, loggerhead shrikes, horned larks, and occasional irruptions (sudden population increases) of lark buntings. Golden and bald eagles nest throughout the region. Sandhill cranes and an occasional whooping crane are present during migration. The Duchesne River is an important corridor for many migratory birds.

Reptiles that inhabit the Uintah Basin include the faded pygmy rattlesnake, striped whipsnake, and Woodhouse's toad.

#### **2.2.3.2 Deer and Elk**

The project team's reconnaissance-level survey and the wildlife strike data collected by UDOT provided information about the presence of deer and elk in the study corridor. Deer and elk require special consideration because of potential conflicts with vehicles on the roadway.

The number of wildlife strikes along a given highway segment correlates with the number of animals that cross the highway in that segment. UDOT's 2005 wildlife strike data indicate that wildlife consistently cross US 40 from the project's western terminus to the city of Roosevelt at about MP 115.

The survey identified the stretch of US 40 between Duchesne and the community of Bridgeland as an area that is frequently used by deer and elk for migration. UDOT's wildlife strike data verify that this area is heavily used by large mammals. Other areas that are frequently crossed by wildlife are Daniels Canyon, the Strawberry Valley, and areas around major water crossings such as Currant Creek and Starvation Reservoir.

#### **2.2.3.3 Sensitive and Special-Status Species**

The reconnaissance-level survey identified habitats that could support sensitive or special-status species. These habitats include raptor nesting or foraging habitat, prairie dog towns (which indicate the possible presence of burrowing owls and black-footed ferrets), and known occupied habitat for Ute ladies'-tresses, a terrestrial orchid that is listed as threatened under the federal

Endangered Species Act. The U.S. Fish and Wildlife Service (USFWS) has noted that Ute ladies'-tresses could occur in drainages that cross or are adjacent to US 40 throughout the Uintah Basin (Herrmann 2007). To ensure that this plant is protected, USFWS recommends conducting surveys for Ute ladies'-tresses in areas with suitable habitat; these surveys should occur during the flowering season (typically early August through early September).

Federal or state governments list 58 species as threatened, endangered, or sensitive in Wasatch, Duchesne, and Uintah Counties. However, this list includes all special-status species known to be present in the entire three-county area and might not reflect the species present in the much smaller US 40 study corridor. Of the 58 species, 16 are birds, 10 are fish, 10 are mammals, four are reptiles or amphibians, one is a mollusk, and 17 are plants (see the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* [HDR 2007a] for a complete listing of the species). Of the 58 species, 41 are State of Utah or BLM sensitive species, while 17 are listed under the federal Endangered Species Act as threatened or endangered.

## 2.2.4 Cultural Resources

The project team's review of the cultural resource site records filed at the Utah Office of State History found that several cultural resource surveys have been completed along the study corridor. However, large stretches of the corridor have not been surveyed for cultural resources. The *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a) provides background information on cultural resources in the area and the results of the records search.

The study corridor extends across an area that is rich in prehistoric and historic cultural resources. The records search identified 33 cultural resource sites along the study corridor (see Table 2.2-4 below). Future improvement projects along the corridor might encounter prehistoric or historic archaeological sites dating from a broad range of time periods. The Uintah Basin is within the traditional rangelands of several Native American tribes, and traditional cultural properties could be encountered. In addition, the corridor passes through several small communities and larger towns where historic commercial buildings and houses are close to the highway. Other historic structures include bridges, culverts, irrigation canals, and US 40 itself as the historic Victory Highway.

**Table 2.2-4. Recorded Cultural Resources along the Study Corridor**

Owner	National Register Status	Date Recorded	Site Type	Date	Comments
NA	Determined Eligible (State Historic Preservation Officer [SHPO] concurrence)	3/2001	Waterworks; dams, ditches, etc.	1907	Gray Mountain Canal
Private	Determined Eligible (SHPO concurrence)	10/2000	Waterworks; dams, ditches, etc.	1907	Martin Lateral
State	Determined Eligible (SHPO concurrence)	3/2001	Transportation	1923	
State	Determined Eligible (SHPO concurrence)	3/2001	Transportation	1923	US 40/ #14 Myton
State	Determined Eligible (SHPO concurrence)	12/2000	Transportation	1880	
Private	Determined Eligible (SHPO concurrence)	3/2001	Waterworks; dams, ditches, etc.	1905	
Private	Determined Eligible (SHPO concurrence)	3/2001	Artifact scatter	Prehistoric	Late prehistoric
Private	Determined Eligible (SHPO concurrence)	3/2001	Artifact scatter	Unknown	Unknown aboriginal
Private	Non-significant (professional judgment)	3/2001	Farming/ranching (agriculture)	1940	
Private	Non-significant (professional judgment)	3/2001	Farming/ranching (agriculture)	1940	
Private	Non-significant (professional judgment)	3/2001	Farming/ranching (agriculture)	1940	
State	Non-significant (professional judgment)	7/2002	Transportation	1900	
State	Determined Eligible (SHPO concurrence)	7/2002	Transportation	1899	Victory Highway
State	Non-significant (professional judgment)	7/2002	Transportation	1930	
State	Non-significant (professional judgment)	7/2002	Transportation	1926	
BLM	Non-significant (professional judgment)	9/1985	Waterworks; dams, ditches, etc.	1890	
State	Determined Eligible (SHPO concurrence)	6/2000	Transportation	1890	
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1907	Pickup Wash Lateral
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1907	
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1890	
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1906	Moffat Canal
Private	Determined Eligible (SHPO concurrence)	6/2001	Farming/ranching (agriculture)	1906	
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1907	
Split estate	Determined Eligible (SHPO concurrence)	6/2001	Waterworks; dams, ditches, etc.	1908	
Private	Determined Eligible (SHPO concurrence)	4/2000	Waterworks; dams, ditches, etc.	1913	Highline Canal
Private	Determined Eligible (SHPO concurrence)	6/2000	Waterworks; dams, ditches, etc.	1905	Ouray Valley Canal
Private	Determined Eligible (SHPO concurrence)	6/2000	Waterworks; dams, ditches, etc.	1880	
Private	Determined Eligible (SHPO concurrence)	6/2000	Waterworks; dams, ditches, etc.	1920	
Tribal	Determined Eligible (SHPO concurrence)	9/2001	Waterworks; dams, ditches, etc.	1886	



**Table 2.2-4. Recorded Cultural Resources along the Study Corridor**

Owner	National Register Status	Date Recorded	Site Type	Date	Comments
Private	Non-significant (professional judgment)	11/2001	Farming/ranching (agriculture)	1890	
Private	Non-significant (professional judgment)	11/2001	Farming/ranching (agriculture)		
State	Determined Eligible (SHPO concurrence)	3/2002	Transportation	1880	Victory Highway/US 40
State	Non-significant (professional judgment)	4/2004	Farming/ranching (agriculture)	1919	

Source: Utah Office of State History 2007

NA = not applicable



## **2.2.5 Section 4(f) and Section 6(f) Resources**

### **2.2.5.1 Section 4(f) of the U.S. Department of Transportation Act**

Section 4(f) of the U.S. Department of Transportation Act of 1966 requires that any actions funded or carried out by agencies of the U.S. Department of Transportation must be evaluated for their potential effects to significant publicly owned public parks, recreation areas, or wildlife and waterfowl refuges and any land from a historic site of national, state, or local significance (49 United States Code [U.S.C.] 303). Because UDOT might complete projects on US 40 in partnership with FHWA and/or the Federal Transit Administration (FTA), the potential presence of Section 4(f) properties is an important factor. Only projects that involve FHWA or FTA are subject to the provisions of Section 4(f).

NEPA regulations for FHWA or FTA projects that occur near or that could potentially affect any Section 4(f) resource require a detailed Section 4(f) analysis. Table 2.2-5 below lists some of the potential Section 4(f) and Section 6(f) resources along the corridor. The status of other resources, such as historic properties, would need to be determined on a case-by-case basis as projects are identified and carried forward into the NEPA phase that requires environmental documentation.

### **2.2.5.2 Section 6(f) of the Land and Water Conservation Fund Act**

State and local governments often obtain grants to acquire or make improvements to parks and recreation areas through the federal Land and Water Conservation Fund Act of 1965 (16 U.S.C. Sections 4601-4 through 4601-11, September 3, 1964, as amended). Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a non-recreational use without the approval of the U.S. Department of the Interior's National Park Service. Section 6(f) directs the Department of the Interior to ensure that replacement lands of equal (monetary) value, location, and usefulness are provided as conditions to such conversions. Parks that have received funding under Section 6(f) are listed below in Table 2.2-5.



**Table 2.2-5. Section 4(f) and Section 6(f) Resources along the Study Corridor**

Resource	Owner/ Administrator	Address or Location	City/Place	Type of Resource
<i>Wasatch County</i>				
Whiskey Spring Picnic Area	USFS	About MP 25.2	East of Heber City	4(f) only
Dry Canyon trailhead	USFS	About MP 26.4	East of Heber City	4(f) only
Clegg Canyon trailhead	USFS	About MP 27.5	East of Heber City	4(f) only
Center Canyon trailhead	USFS	About MP 30.4	East of Heber City	4(f) only
Lodgepole Campground	USFS	About MP 33.7, west of highway	East of Heber City	4(f) only
Daniels Summit trailhead and recreation access parking area	USFS	About MP 34.4, at Daniels Summit	East of Heber City	4(f) only
Telephone Hollow trailhead and recreation access parking area	USFS	About MP 35.7	East of Heber City	4(f) only
Quarry trailhead and recreation access parking area	USFS	About MP 36.4	East of Heber City	4(f) only
Strawberry River trailhead and recreation access parking area	USFS	About MP 37	East of Heber City	4(f) only
Strawberry visitor center	USFS	About MP 40.3, south of highway	Strawberry Reservoir	4(f) only
Co-op Creek trailhead and recreation access parking area	USFS	About MP 41.6, north of highway	Strawberry Reservoir	4(f) only
Chicken Creek east parking and fishing access	USFS	About MP 42.6, south of highway on lake shore	Strawberry Reservoir	4(f) only
Ladders parking and fishing access	USFS	About MP 45.3, west of highway on lake shore	Strawberry Reservoir	4(f) only
Sage Creek day-use area	USFS	About MP 47.5, south of highway	Strawberry Reservoir	4(f) only
Soldier Creek trailhead and recreation access parking area	USFS	About MP 50, south of highway on lake shore	Strawberry Reservoir	4(f) only
<i>Duchesne County</i>				
Currant Creek Wildlife Management Area	Utah Division of Wildlife Resources	About MP 58–59	Near Fruitland	4(f) only
Starvation State Park	Utah State Parks	About MP 81	Duchesne	4(f) only
Duchesne Park and Pool Complex	City of Duchesne	100 W. Main Street, Duchesne	Duchesne	4(f) and 6(f)
Myton City Park	City of Myton	About MP 105	Myton	4(f) and 6(f)
Roosevelt Regional Park	City of Roosevelt	About MP 116	Duchesne	4(f) and 6(f)

**Table 2.2-5. Section 4(f) and Section 6(f) Resources along the Study Corridor**

Resource	Owner/ Administrator	Address or Location	City/Place	Type of Resource
<i>Uintah County</i>				
Ballard Park	City of Ballard/ Uintah Recreation District	About MP 116.5, north of highway	Ballard	4(f) only
Cobble Rock Park	City of Vernal/Uintah Recreation District	About MP 144.3, south of highway	Vernal	4(f) and possibly 6(f)
Kiwanis Park	Uintah Recreation District	About MP 144.4, north of highway	Vernal	4(f) only

Sources: Utah Division of Wildlife Resources 2002; USFS 2007; Uintah Recreation District 2007

## 2.2.6 Hazardous Materials

EPA and the State of Utah maintain several databases of hazardous waste sites and handlers. These include the RCRAInfo database, Superfund National Priorities List, Brownfields Properties, National Response Center database, and lists of leaking underground storage tanks.

According to EPA's RCRAInfo database, there are three hazardous waste handlers in Uintah and Duchesne Counties near the study corridor. Table 2.2-6 summarizes the types and locations of these handlers.

**Table 2.2-6. Hazardous Waste Handlers along the Study Corridor**

Handler	Type(s) of Material	Address	City	County
GWEC-Bluebell Gas Plant	Crude petroleum and natural gas extraction and natural gas liquid extraction	108 North 200 East (about MP 114.5, southeast of highway)	Roosevelt	Duchesne
Pennzoil Company	Petroleum refinery (permitted large-quantity generators)	West US 40 (about MP 117, about 1.5 miles west of the city)	Roosevelt	Duchesne
Dowell Schlumberger Western Water	Support activities for oil and gas operations	1170 E. Main Street (about MP 145.2, east of highway)	Vernal	Uintah

Source: EPA 2007a

This table includes only handlers/generators as reported through RCRAInfo and those identified as large-quantity generators on the EPA handlers list. The table does not include all permitted small-quantity waste generators/handlers, of which there are many along the corridor; that information is available from EPA at [www.epa.gov](http://www.epa.gov).

The Resource Conservation and Recovery Act (RCRA) Corrective Action database includes a listing for the Pennzoil facility on West US 40 in Roosevelt. There are no Superfund or Brownfields sites along the corridor (EPA 2007b).

The federal National Response Center is the nationwide clearinghouse for spill reporting. There have been 23 documented spills of hazardous materials to land along the corridor. A detailed list of these spills is provided in the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a).

The Utah Division of Environmental Response and Remediation compiles information on underground storage tanks. There are numerous records for leaking underground storage tanks along the corridor. The locations of these tanks, as well as of those tanks with records indicating that the tanks have been closed, are also listed in the *Technical Report of Existing Environmental Conditions in Support of the US 40 Corridor Study* (HDR 2007a).

## 2.3 Land Use and Demographics

### 2.3.1 Land Use along the Study Corridor

The operation of US 40 is influenced by existing land uses. Future or planned land uses will also affect how the highway functions and might contribute to the need for future roadway improvements. The following sections summarize the existing and planned land uses along the US 40 study corridor. Detailed information about land use along the corridor is available in the *Existing Facility Conditions Report in Support of the US 40 Corridor Study* (HDR 2007b).

#### 2.3.1.1 General Characteristics

Although most land in the three counties through which the study corridor passes is publicly owned, most land adjacent to the highway is privately owned (see Figure 2-1, Land Ownership, and Table 2.3-1 below). Private landowners very likely access their land using US 40 and its connecting roads.



**Table 2.3-1. Land Ownership along the Study Corridor**

Owner or Administrator	Acres	Percent of Total
Federal agencies	41,514.38	23.63%
USFS	27,668.03	15.75%
BLM	13,846.35	7.88%
State agencies	14,832.25	8.44%
Utah School and Institutional Trust Lands Administration	5,119.33	2.91%
Utah State Parks	2,463.02	1.40%
Utah Division of Wildlife Resources	7,249.90	4.13%
Ute Tribe	12,972.97	7.39%
Other	106,300.80	60.52%
Private	103,658.31	59.02%
Water bodies	2,642.49	1.50%

Source: USU 2006

Six incorporated cities are situated next to US 40 along the study corridor: Duchesne, Myton, and Roosevelt in Duchesne County and Ballard, Vernal, and Naples in Uintah County. Towns and settlements along or near the corridor include Fruitland, Fort Duchesne, and Jensen. For the most part, these towns and settlements rely on the larger population centers for goods and services, though some services are locally available.

The following sections summarize land uses along the study corridor by jurisdiction.

### **2.3.1.2 County and City Governments**

#### **Wasatch County**

Wasatch County is the westernmost county along the study corridor. Its western boundary is about 40 miles east of Salt Lake City, and the proximity of Salt Lake City greatly affects population and employment in the county. Most people who live in Wasatch County drive west to work in Park City or the Salt Lake Valley. The year-round population and irrigated farmlands are concentrated in the Heber and Round Valleys, which are outside (west) of the project area. Strawberry Valley, which is along the study corridor to the east of Daniels Summit, supports a seasonal (summer) population focused on Strawberry Reservoir.

Future land use and planning for Wasatch County is detailed in the *Wasatch County General Plan* (Wasatch County Planning Commission 2001). Most land

along US 40 is administered by USFS, though there is some Utah Division of Wildlife Resources land west of the reservoir (see Figure 2-1, Land Ownership). Privately held lands are concentrated near Strawberry Reservoir. BLM administers a small piece of land at the western edge of the study corridor (Wasatch County Planning Commission 2001; SITLA 2007a). There are no incorporated cities along the study corridor in Wasatch County.

## **Duchesne County**

The US 40 corridor traverses the width of Duchesne County, a road distance of about 57 miles. The highway passes through three incorporated cities in the county: Duchesne, Myton, and Roosevelt.

As in Wasatch County, most land in Duchesne County is publicly owned, though the majority of land along US 40 is privately owned (Duchesne County 1997; SITLA 2007b). Starvation State Park, home to Starvation Reservoir, is situated on US 40 just west of the city of Duchesne. SR 191, a major highway that links the Uintah Basin with areas to the south, intersects US 40 in Duchesne. Tribal lands are scattered along the US 40 corridor, though there is a contiguous area of tribal land adjacent to the highway between Starvation State Park and the city of Duchesne.

Although private land along the US 40 corridor in Duchesne County is mostly rural residential and agricultural, there are pockets of denser residential and commercial development outside the cities (Duchesne County, no date). The area around Fruitland (about MP 62) is designated for commercial uses, as is the area where SR 208 intersects US 40 (about MP 68) and an area north of the highway just east of Starvation Reservoir (about MP 83). A long commercial corridor begins just northeast of Myton and continues to the city limit of Roosevelt. Land identified for residential development (one dwelling unit per 2.5 acres) is concentrated just west of Fruitland, around Duchesne, and along the highway just north of Myton. Industrial uses are located just north of Duchesne, just north of Myton, and just southwest of Roosevelt. Land uses associated with the incorporated cities are discussed below.

### ***Duchesne***

Not to be confused with the community of Fort Duchesne in Uintah County, the city of Duchesne is the westernmost incorporated city along the study corridor. The city is the seat of Duchesne County and is located at the intersection of US 40 and SR 191, the major route into the Uintah Basin from the south (SR 191 and US 40 are the same road from Duchesne to Vernal about 60 miles to the east).



US 40 is also known as Main Street in Duchesne. On its land-use map, the City designates all land along the highway as Commercial except for a short section on the eastern edge of the city along US 40 that is identified as Residential-Agriculture (suitable for rural residential development). In general, residential land south of the highway is designated for rural residential use, while residential land north of the highway is identified for both traditional residential and rural residential use. An area on the eastern city limits south of US 40 is designated for Industrial use. There is a large area of tribal land south of the city along the SR 191 corridor.

### ***Myton***

Myton is the smallest incorporated city along the study corridor (population 539 in 2000 [U.S. Census Bureau 2000]). It is situated about 18 miles east of Duchesne on the Duchesne River. Much of the land around Myton is tribal land. Land use in Myton is dominated by rural residential development and agricultural support activities.

### ***Roosevelt***

Roosevelt is the largest city in Duchesne County. The city center is located about 28 miles east of Myton and 1 mile west of the Duchesne County–Uintah County line at the intersection of SR 121 and US 40. Roosevelt serves as the commercial center for the nearby small towns and settlements in both counties, including the nearby settlements of Ballard (population 566 in 2000 [U.S. Census Bureau 2000]) and Fort Duchesne (population 621 in 2000 [U.S. Census Bureau 2000]) in Uintah County.

According to the Roosevelt City Planner, most land within the city limits and adjacent to US 40 is identified for commercial and industrial uses (Eschler 2007). Roosevelt's zoning map assigns a Commercial/Light Manufacturing designation to land along the highway between the southwestern city limit and about 800 South. The city's industrial park, which is located near the southwestern city limit, is accessed from US 40. North of 800 South, the Commercial/Light Manufacturing zone continues on the west side of the highway to about 400 South, and land on the east side of the highway is designated as Commercial-Selling. The remainder of the highway corridor through the city is assigned a Commercial-Selling designation. Residential land is evenly dispersed on either side of the highway throughout the city, with densities decreasing along with the distance from the highway. There is very little agricultural land within the city limits; what is present is situated on the city's boundaries, where it abuts land under the jurisdiction of the counties.

## **Uintah County**

Uintah County is the easternmost county in Utah along US 40. The highway extends 60 miles from the Duchesne County–Uintah County line to the Utah–Colorado border. The study corridor extends only about 42 miles from the county line to the community of Jensen near the intersection of US 40 and SR 149. This intersection is the “gateway” to Dinosaur National Monument, a major tourist destination.

As in Wasatch and Duchesne Counties, most of the land in Uintah County is publicly owned. Ownership along US 40 is a mixture of public (state and federal), tribal, and private land; most of the private land is concentrated in and around the cities of Vernal and Naples. Ute tribal land along the highway is concentrated in the western part of the county near the tribal headquarters of Fort Duchesne, where tribal land is intermixed with private land. BLM-administered land is concentrated along a 10-mile-long stretch of US 40 west of Vernal, an area that also contains a concentration of state trust lands. Most land east of Vernal and Naples is privately owned, though there is a limited amount of state trust and BLM-administered land in this area.

The current Uintah County land-use map (Uintah County 2005) primarily assigns Agriculture (western and eastern ends of the study corridor) and Mining and Grazing designations to less-developed portions of the study corridor. The map shows limited amounts of commercially designated land associated within the unincorporated communities of Fort Duchesne and Jensen. Land uses associated with the incorporated cities are discussed below.

### ***Ballard***

Ballard is the westernmost city in Uintah County on US 40. Ballard abuts Roosevelt in Uintah County and is very close to the community of Fort Duchesne.

Land along US 40 in Ballard is zoned for commercial use. Industrial land is concentrated on the eastern end of the city, with most industrial land occurring north of US 40. Rural residential development is evenly distributed north and south of the highway and is concentrated in the western two-thirds of the incorporated area. Land on the far north and south ends of Ballard is zoned for agricultural use.





### ***Vernal***

Vernal, the seat of Uintah County, is about 30 miles east of Roosevelt. The city is an important regional center for the oil and gas industries and for recreation. SR 191 splits from US 40 in Vernal and provides a connection to the Flaming Gorge National Recreation Area.

Land in Vernal and along the US 40 corridor is primarily zoned for commercial and industrial uses. There are pockets of residential agricultural land and single-family residential land along the corridor. North of 100 North, US 40 turns to the east. Land in this area, which is the heart of downtown Vernal, is primarily zoned as Central Commercial. Commercial zoning continues until about 800 East, where the zoning changes to Industrial. The land between this point and the eastern city limit maintains the Industrial zoning.

### ***Naples***

Naples is a small city about 2 miles southeast of Vernal. Like Vernal, commerce in Naples is focused on the oil and gas industries and recreation. Naples is the fastest-growing city along the study corridor (U.S. Census Bureau 2000; Governor's Office of Planning and Budget 2005a).

Land in the northern part of Naples is zoned for industrial uses. This is a continuation of Vernal's industrial zone. Moving south on US 40, the zoning changes to Commercial. There is a Commercial Design Guideline Overlay area along US 40 within the city. The Vernal Airport is accessed from US 40 in Naples.

## **2.3.1.3 State and Federal Government Lands**

### **U.S. Forest Service**

USFS manages much of the land along the western end of the study corridor as part of the Uinta National Forest. USFS ownership begins in Daniels Canyon and extends to the east side of Strawberry Reservoir. There are a few areas of private ownership in this stretch of US 40 (such as at the intersection of East Main Canyon Road and US 40, the area west of the reservoir, and around the reservoir itself).

The area around Strawberry Reservoir experiences heavy recreation use due to its notable sport fishery and its proximity to population centers in the Salt Lake, Utah Lake, and Heber Valleys. The *Uinta National Forest Plan* (USFS 2003) recognizes the importance of US 40 but does not prescribe any specific goals or objectives for the highway's relationship to future resource management in the area.

## **Bureau of Land Management**

Most of the federal BLM-administered land along the study corridor is between the eastern boundary of the Uintah-Ouray Indian Reservation and Vernal. There are also small areas of BLM-administered land on the western end of the corridor near Heber City and on the eastern end near Jensen. Most of the BLM-administered land along the corridor is managed by the Vernal Field Office. BLM has identified formal Transportation and Utility Corridors throughout the region, including along and near US 40 between the eastern boundary of the Uintah-Ouray Indian Reservation and the state trust lands west of Vernal, and between the eastern limits of the city of Naples to the Utah-Colorado state line. According to BLM, the purpose of designating these corridors is to show where the agency encourages the placement of utilities, and the corridors are designated in areas where there are existing facilities. Any improvements to US 40 would not affect the way BLM currently manages the land along these corridors.

## **State of Utah School and Institutional Trust Lands Administration**

The State of Utah School and Institutional Trust Lands Administration (SITLA) owns parcels of land and mineral-only lands (subsurface land) all along US 40. Most SITLA-owned land along the study corridor is situated between the eastern boundary of the Uintah-Ouray Indian Reservation and Vernal. SITLA-owned mineral-only lands occur in Daniels Canyon in Wasatch County and between Duchesne and Roosevelt in Duchesne County.

SITLA land, which is managed for the financial benefit of 12 real estate trusts, is occasionally made available for purchase by private parties. SITLA surface and subsurface lands can also be leased for a variety of uses.

## **Utah Division of Wildlife Resources**

The Utah Division of Wildlife Resources manages a number of wildlife management areas (WMAs) on or near US 40. WMAs are managed for passive recreational use (such as hiking and wildlife viewing), habitat protection, big-game hunting, fishing, and as wildlife refuges. Overnight camping is allowed at some WMAs.

## **Uintah-Ouray Indian Reservation**

The Uintah-Ouray Indian Reservation is located in the heart of the Uintah Basin. The reservation headquarters are in Fort Duchesne, which is just south of US 40. The Uintah-Ouray Indian Reservation is the second-largest Indian reservation in the United States and encompasses over 4.5 million acres. The Uinta Mountains



define the northern border of the reservation, while the Green River runs through the reservation's southern end.

The tribal government oversees the reservation and about 1.3 million acres of off-reservation trust land. There are distinct residential communities associated with the reservation. The tribal government operates several businesses that also define much of the land use, including mining businesses (oil, gas, tar sands, and gilsonite) and livestock production.

## 2.3.2 Demographics of the Study Corridor

The operation of US 40 is influenced by existing population and employment, and future growth in population and employment might contribute to the need for future roadway improvements. The *Existing Facility Conditions Report in Support of the US 40 Corridor Study* (HDR 2007b) describes the current and projected population and employment in the cities and counties along the study corridor. The following sections summarize that information.

### 2.3.2.1 Population

#### Counties along the Study Corridor

The most recent population estimates (2005) for Wasatch, Duchesne, and Uintah Counties are as follows (Governor's Office of Planning and Budget 2006, 2007a):

- Wasatch County: 21,000
- Duchesne County: 15,200
- Uintah County: 26,900

In general, the population projections from the Governor's Office of Planning and Budget (2005a, 2007a) show moderate growth in Duchesne and Uintah Counties (1.3% and 1.7% per year, respectively) and very rapid growth in Wasatch County (3.72% per year) between now and 2030.

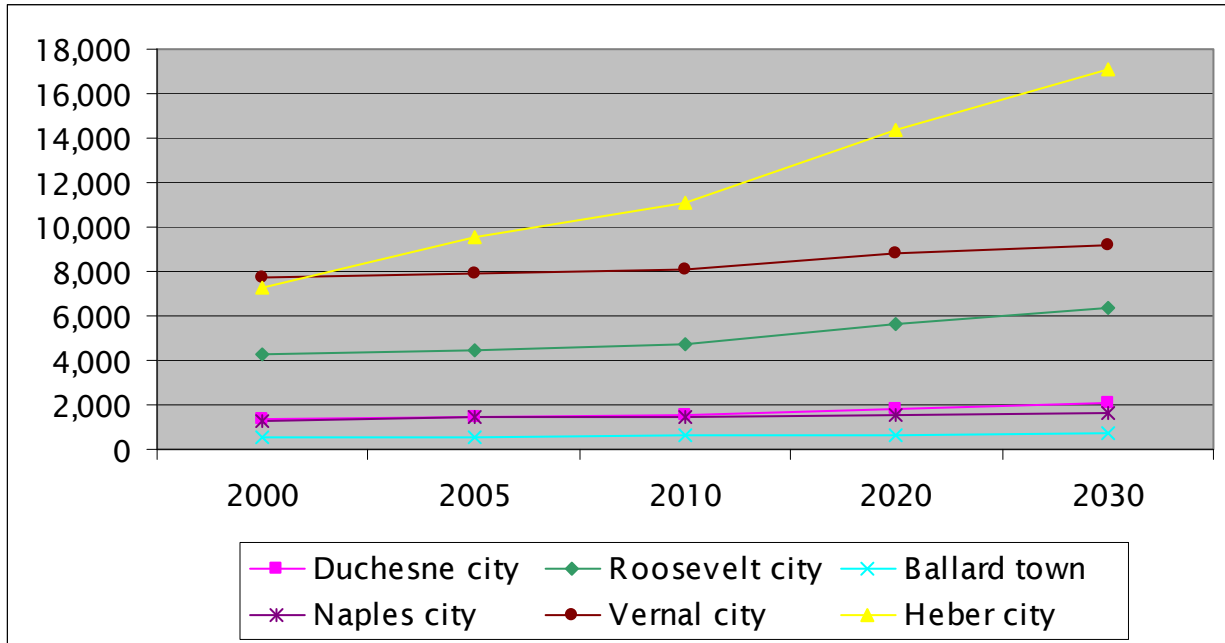
#### Cities along the Study Corridor

The most recent population estimates for the cities of Heber City, Duchesne, Roosevelt, Ballard, Vernal, and Naples are as follows (Governor's Office of Planning and Budget 2005a):

- |                     |                    |                 |
|---------------------|--------------------|-----------------|
| • Heber City: 7,291 | • Roosevelt: 4,299 | • Vernal: 7,714 |
| • Duchesne: 1,408   | • Ballard: 566     | • Naples: 1,300 |

The cities along the corridor are projected to grow between 0.6% and 1.3% annually between 2000 and 2030 (Governor's Office of Planning and Budget 2005a). Chart 2-1 compares the cities' projected 30-year population growth.

**Chart 2-1. Comparison of Projected 30-Year Population Growth for Cities along the US 40 Study Corridor**

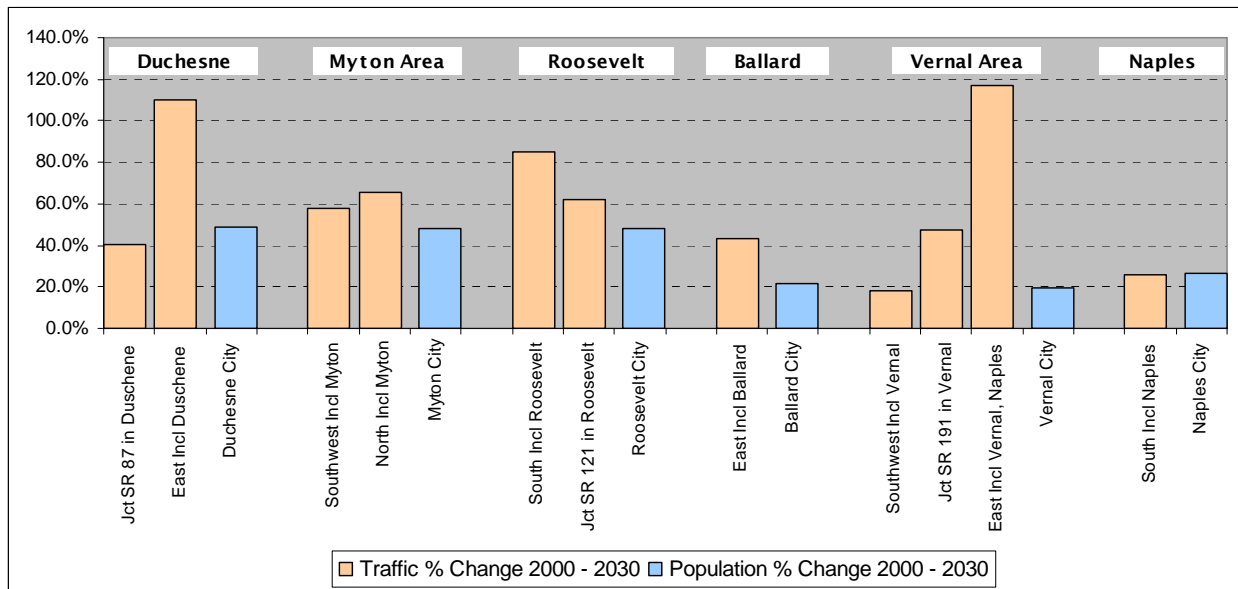


Source: Governor's Office of Planning and Budget 2005a

Chart 2-2 below compares the projected percentage increase in traffic along the more urbanized segments of the corridor to the projected percentage increase in population in the cities along those segments. The increases in traffic shown in the chart, particularly in Dukesne and Vernal, are much higher than the expected population growth. See Chapter 3, Study Corridor Segment Details, for more information about future traffic projections.



**Chart 2-2. Comparison of Projected 30-Year Population Growth and Traffic along the US 40 Study Corridor**



Source: Governor's Office of Planning and Budget 2005a

### 2.3.2.2 Employment

The Governor's Office of Planning and Budget provides employment projections at the county level only (Governor's Office of Planning and Budget 2005b). The most recent data available for Wasatch County show an expected annual employment increase of 3.15% (Governor's Office of Planning and Budget 2005b). Employment in Wasatch County is largely driven by jobs in education and health services, government services, leisure and hospitality services, and construction (Governor's Office of Planning and Budget 2005b).

Employment in Uintah County is driven by jobs in natural resources and mining and trade, transportation, and utilities (Governor's Office of Planning and Budget 2005b). Recent estimates by the Governor's Office of Planning and Budget project a peak in Uintah County mining employment of about 4,000 workers in about 2010 and then a decline of about 25% in the following 20 years (Governor's Office of Planning and Budget 2007b). The estimated 2050 mining employment would still be about the same as the 2004 peak employment figures (about 3,000 workers). The projected decline is due to a number of factors, the most significant of which is the low number of workers that would be needed to operate the completed wells (about five workers are needed per completed well) and the estimated amounts of resources that would be extracted over time.

As in Uintah County, Duchesne County's economy is driven by jobs in natural resources, mining, trade, transportation, and utilities. Because of this, it is likely that the same mining employment trend described above would apply to Duchesne County.

## 2.4 Roadway Characteristics

US 40 is a primary east-west corridor in northern Utah. The highway provides an important link between the Uintah Basin and the greater Salt Lake City area, and also provides support for the ongoing economic development of the basin and access to a number of important recreation areas. UDOT manages the day-to-day operation and maintenance of the corridor through maintenance stations in Heber City, Strawberry, Tabiona (off SR 35, just north of US 40), Duchesne, Roosevelt, and Vernal. The day-to-day activities performed through the maintenance stations include removing snow, leveling lanes, sealing cracks, maintaining shoulders and drainage systems, cleaning up hazardous spills, and repairing road and structure damage. The work overseen through the maintenance stations is critical to the safe operation of US 40.

Planning for projects that go beyond maintenance starts at the UDOT Region 3 office in Orem. Region 3 project managers identify, plan, and oversee completion of larger projects such as highway widening. Region 3 staff members also work cooperatively with staff from UDOT headquarters to identify projects and project funding options.

A basic understanding of the current conditions of the roadway is necessary in order to determine what types of future projects are needed along US 40. This section describes the existing highway geometrics, structural conditions, traffic conditions, and bicycle and pedestrian facilities of the 136-mile-long US 40 study corridor. Detailed information about the existing roadway characteristics is available in the *Existing Facility Conditions Report in Support of the US 40 Corridor Study* (HDR 2007b).

### 2.4.1 Highway Geometrics

#### 2.4.1.1 Terrain

*Terrain type* is a factor that greatly affects roadway conditions and ultimately how roads operate. Roadway terrain is typically described as *level*, *rolling*, or *mountainous*. On level terrain, all types of vehicles can generally maintain the same speeds. On rolling terrain, the speeds of heavy vehicles (such as heavy trucks) can be substantially slower than those of passenger vehicles, but are not



so slow that heavy vehicles have to operate at “crawl” speeds for long periods of time. Mountainous terrain causes heavy vehicles to operate at crawl speeds for significant distances or frequent intervals (TRB 2000).

In general, US 40 traverses mountainous terrain with steep grades on the west end of the corridor through Daniels Canyon and more level and rolling terrain in the Uintah Basin. There are truck climbing lanes at MP 43, between MP 106 and MP 107, and between MP 152 and MP 153. Passing lanes, which can also serve as climbing lanes in some areas, are summarized in Section 2.4.1.3, Passing Opportunities.

#### **2.4.1.2 Horizontal and Vertical Alignment**

Roadway alignment is simply the path that a roadway’s centerline follows. Alignment is described in terms of horizontal and vertical planes. The combination of horizontal and vertical alignments serves as the primary controlling element associated with the design of all types of public streets and highways. Alignment affects roadway capacity, safety, and function.

The project team found that there is little information available about the existing horizontal and vertical alignment of the highway. Historic as-built plans for the highway provide limited information about alignment, but the stationing (that is, reference points) is different from the current milepost system, which makes a direct comparison between historic information and current conditions difficult. Existing alignment issues have been identified by people who use US 40 on a regular basis, by UDOT maintenance station personnel, and by the road departments of local government agencies. Alignment issues include, but are not limited to, the following:

- Intersections with alignments that are not adequate to accommodate truck turning movements
- Poor drainage systems in the more urbanized sections
- Lack of acceleration and deceleration lanes associated with vertical curves
- Lack of compatibility with grades and elevations existing on adjacent land and approaching roads and drives adjacent to the highway
- Grade lengths and percentages along the highway that result in safety and operational problems



### 2.4.1.3 Passing Opportunities

Table 2.4-1 shows the percentage of each segment of the study corridor in which passing is allowed. This percentage includes sections where passing by pulling into the opposing travel lane is allowed, as well as sections where there are existing passing lanes in either direction of travel.

**Table 2.4-1. Percentage of the Corridor in Which Passing Is Allowed**

Segment	Percentage of Segment in Which Passing Is Allowed
1	92.9%
2	83.2%
3	82.6%
4	75.9%
5	85.5%
6	79.1%
7	81.9%
8	90.4%

Source: UDOT 2006a



Table 2.4-2 lists the existing passing lanes on US 40 in the study corridor.

**Table 2.4-2. Existing Passing Lanes on US 40 in the Study Corridor**

Beginning MP	Length (miles)	Direction <sup>a</sup>	Notes
23.34	7.09	EB	4% grade
31.29	3.23	EB	4% grade
35.11	0.53	WB	4% grade
42.97	0.34	EB	4% grade
45.88	1.96	EB	4% grade
48.83	0.36	EB	4% grade
50.62	0.41	EB	5% grade
58.34	11.19	WB	4% to 5% grade
59.08	0.35	EB	5% grade
60.06	0.32	WB	No grade
61.60	0.16	WB	No grade
69.31	0.88	EB	3% grade
70.33	0.36	WB	No grade
80.76	6.81	WB	3% grade
85.88	0.92	EB	Inside Duchesne city limits (two lanes)
86.80	3.47	WB	0.92 mile inside Duchesne (two lanes); no grade
106.04	1.51	EB	0% grade
109.50	0.84	WB	4.5% grade
111.33	4.00	EB	Inside Roosevelt
115.41	4.08	WB	Inside Roosevelt (two lanes)
118.79	0.90	EB	No grade
120.16	0.77	WB	3% grade
138.55	1.27	EB	4% grade
141.24	7.18	EB	Inside Vernal/Naples (two lanes)
148.41	7.56	WB	Inside Vernal/Naples (two lanes)

Source: UDOT 2006a

<sup>a</sup> EB = eastbound, WB = westbound

#### 2.4.1.4 Right-of-Way Width

The right-of-way width for US 40 varies significantly throughout the study corridor, especially within the different city limits. UDOT does not have recommended right-of-way widths for rural highways such as US 40. Table 2.4-3 shows the average right-of-way width by segment.

**Table 2.4-3. Average Right-of-Way Width by Segment of US 40 in the Study Corridor**

Segment	Average Right-of-Way Width (feet) <sup>a</sup>
1	133
2	232
3	168
4	137
5	97
6	256
7	113
8	108

Source: UDOT 2004a

<sup>a</sup> Width calculated using weighted average of sections of roadway for which specific right-of-way widths are available, by segment.

#### 2.4.1.5 Lane and Shoulder Width

The entire US 40 corridor has 12-foot-wide travel lanes, which the American Association of State Highway and Transportation Officials (AASHTO) recommends for rural highways.<sup>1</sup> The US 40 corridor also has several areas with medians, right-hand turn lanes, and/or acceleration lanes. This study assumes that these median, turn, and acceleration lanes are 12 feet wide. In urban areas, there is typically a median within the city limits. Shoulder widths are the narrowest (0 to 1.9 feet wide) over Daniels Summit and through Vernal. Narrow shoulders measuring 2 feet to 4 feet wide are also present near Strawberry Reservoir and Fruitland and from the eastern limit of Naples to Jensen (UDOT 2004a).

<sup>1</sup> AASHTO is a nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico. Its primary goal is to foster the development, operation, and maintenance of an integrated national transportation system. A primary focus of AASHTO is policy and standard development. In many cases, AASHTO's recommended standard has been adopted by UDOT as the standard for the state of Utah. Where UDOT does not have a stated standard, the AASHTO-recommended standard applies.



Based on a video log for US 40 (UDOT 2006a), the existing shoulder widths appear to meet AASHTO's standards in most places. However, information provided on UDOT's Utah Bicycle Suitability Map (UDOT 2004b) conflicts with the video log and shows that there are some areas where the shoulder does not meet AASHTO's standards. Future project-level analyses will need to review the actual shoulder widths along US 40 and address any issues associated with inadequate shoulder widths.

## 2.4.2 Structural Conditions

### 2.4.2.1 Pavement Condition

Table 2.4-4 shows the overall pavement ratings for US 40 in the study corridor. All of the segments in the corridor are in good or fair condition. The pavement condition was determined by looking at data such as the number of skids and the rut depth, which were averaged for each segment. Because each segment's condition was averaged, there might be a few miles within each segment that could be classified as poor. Such poor conditions are present at MPs 115, 116, 148, and 150.

**Table 2.4-4. Pavement Condition of US 40 in the Study Corridor**

Segment	Pavement Condition
1	Good
2	Good
3	Fair
4	Good
5	Fair
6	Good
7	Fair
8	Good

Source: UDOT 2006b

### 2.4.3 Drainage

For the majority of US 40, stormwater runs off the road as sheet flow and drains into either roadside ditches or into natural drainage features such as creeks and washes along or near the highway. However, in some of the cities, there are closed drainage systems where the water is collected by curbs, gutters, and drains. Local residents and UDOT maintenance personnel have stated that drainage in the cities is inadequate, especially where the road level is higher than the adjacent curb. Specific locations that have poor drainage include Duchesne, Roosevelt, and Vernal (HDR 2007c; KMP Planning 2007a, 2007b).

### 2.4.4 Bridge and Structure Conditions

Bridge sufficiency ratings are used to determine whether a bridge is eligible for bridge replacement and rehabilitation and can indicate the relative condition of a structure. The ratings are based on structural adequacy, compliance with current design standards, importance for public use, and eligibility for federal bridge-replacement funds. Bridge sufficiency ratings are applied to bridges and other similar structures like the concrete irrigation ditch over US 40 at MP 118.4. Ratings below 50 indicate that the structure should be replaced. Ratings between 50 and 80 indicate that the structure is in fair condition and that rehabilitation, if cost-effective, should be considered. Structures with ratings of 80 or higher are in good or very good condition and are not eligible for federal funding through the Highway Bridge Rehabilitation and Replacement (HBRR) Program.

Currently, only one of the 22 structures along the study corridor is in poor condition (rated below 50); four others are in fair condition (rated between 50 and 80). Table 2.4-5 lists the names and locations of the structures in poor or fair condition.

**Table 2.4-5. Poor and Fair Structures along the US 40 Study Corridor**

Structure Number	Bridge	Beginning Milepost	Sufficiency Rating	Condition
D-595	Red Creek Bridge	65	43.3	Poor
D-592	Bridge over Sand Wash	66.5	62	Fair
E-1096	Dry Gulch Canal	106.3	79.1	Fair
D-593	Cottonwood Creek	114.6	75.2	Fair
D-658	Ditch over US 40	118.4	60	Fair

Source: UDOT 2007a



## 2.4.5 Traffic Conditions

### 2.4.5.1 Level of Service

Level of service (LOS) is a measure of the traveling conditions on a road, generally for aspects such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience (TRB 2000). The Transportation Research Board defines the following six levels of service:

- A: Free flow of traffic
- B: Reasonably free flow
- C: Stable flow
- D: Approaching unstable flow
- E: Unstable flow
- F: Forced or breakdown flow

As detailed in the *Existing Facility Conditions Report in Support of the US 40 Corridor Study* (HDR 2007b) and as detailed in Appendix B, Level of Service Methodology, two types of level of service analyses were performed for the US 40 study corridor: an analysis of level of service on highway segments and an analysis of level of service at intersections that have traffic signals. The two separate analyses were necessary to accurately capture the existing conditions along US 40 since it travels through both rural (largely undeveloped) and more urban areas.

#### Levels of Service on Highway Segments

For US 40, the highway segment analysis was performed on areas outside of urban areas, and the analysis included consideration of existing passing lanes along the corridor. This analysis resulted in a list of 12 LOS segments that is different from the eight corridor study segments since the urban areas were not included and since the effects of terrain (mountainous, rolling, or level) on traffic function were considered as part of the analysis. Table 2.4-6 below shows the definitions used to determine the level of service along US 40.

**Table 2.4-6. Definitions of Level of Service on Highways**

LOS	Percent of Time Spent Following (%)	Average Travel Speed (mph)
A	< 35	> 55
B	> 35–50	> 50–55
C	> 50–65	> 45–50
D	> 65–80	> 40–45
E	> 80	< 40

Source: TRB 2000

In general, the existing (2005) level of service on US 40 is LOS D or better during both the morning (AM) and evening (PM) peak travel periods (see Table 2.4-7 and Table 2.4-8 below), except for one section just outside the Vernal-Naples urban area.





**Table 2.4-7. Level of Service on US 40 in the Study Corridor in 2007 during the AM Peak Period**

LOS Analysis Segment <sup>a</sup>	Begin MP	End MP	Section Length (miles)	Volume EB/WB	LOS	Average Speed (mph)	Percent of Time Spent Following
1	21.40	35.64	14.24	131/111	A	59.1	25.5
2	35.64	42.97	7.33	131/111	C	53.9	54.1
3	42.97	58.34	15.37	114/108	A	59.7	24.4
4	58.34	72.33	13.99	114/108	A	55.5	32.0
5	72.33	85.86	13.53	129/125	A	58.0	27.1
6	86.81	104.57	17.76	164/133	D	44.4	58.1
7	105.56	110.34	4.78	265/261	B	55.5	42.9
8	115.20	116.62	1.42	265/261	E	37.7	63.8
9	116.62	120.34	3.72	351/324	C	49.1	54.8
10	121.90	137.55	15.65	230/281	C	47.0	63.0
11	137.55	139.83	2.28	395/310	C	54.4	57.0
12	149.94	157.10	7.16	369/324	D	51.3	69.8

<sup>a</sup> The segments that were used for the highway level of service analysis are different from the project segments because urban areas were not included and because the analysis considers how terrain affects level of service. Gaps in the segments listed in this table represent urban areas that were not included in the level of service analysis.

**Table 2.4-8. Level of Service on US 40 in the Study Corridor in 2007 during the PM Peak Period**

LOS Analysis Segment <sup>a</sup>	Begin MP	End MP	Section Length (miles)	Volume EB/WB	LOS	Average Speed (mph)	Percent of Time Spent Following
1	21.40	35.64	14.24	123/129	A	57.8	26.9
2	35.64	42.97	7.33	123/129	C	53.8	55.4
3	42.97	58.34	15.37	113/112	A	59.9	24.5
4	58.34	72.33	13.99	113/112	A	55.9	30.4
5	72.33	85.86	13.53	122/130	A	58.1	26.3
6	86.81	104.57	17.76	169/190	D	44.0	56.6
7	105.56	110.34	4.78	348/327	C	54.9	50.2
8	115.20	116.62	1.42	348/327	E	36.5	69.0
9	116.62	120.34	3.72	483/446	C	47.7	63.8
10	121.90	137.55	15.65	282/344	D	47.0	66.9
11	137.55	139.83	2.28	560/448	D	52.2	68.2
12	149.94	157.10	7.16	354/448	D	51.2	73.3

<sup>a</sup> The segments that were used for the highway level of service analysis are different from the project segments because urban areas were not included and because the analysis considers how terrain affects level of service. Gaps in the segments listed in this table represent urban areas that were not included in the level of service analysis.

## Levels of Service at Intersections with Traffic Signals

The level of service in urban areas along US 40 through Vernal and Roosevelt was analyzed to develop a baseline of existing traffic conditions. Table 2.4-9 lists the definitions of level of service at intersections. See Appendix B, Level of Service Methodology, for more information about intersection level of service calculations.

**Table 2.4-9. Definitions of Level of Service at Intersections**

LOS	Intersection Delay (seconds)
A	0 to 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80

Source: TRB 2000

Table 2.4-10, Table 2.4-11, Table 2.4-12, and Table 2.4-13 below summarize the existing (2007) levels of service in the Roosevelt-Ballard and Vernal-Naples urban areas. These tables show that all intersections in Roosevelt are operating at LOS C or better. During the PM peak period, some intersections in Vernal operate at LOS D through LOS F. The PM peak periods generally experience greater delays due to the higher traffic volumes.



**Table 2.4-10. Level of Service and Delay at Intersections on US 40 in Roosevelt in 2007 during the AM Peak Period**

Intersection	LOS and Seconds of Delay by Location				Overall Intersection LOS and Delay
	US 40		Cross Street		
	EB	WB	NB	SB	
State Street	A 1.9 sec	A 0.4 sec	C 29.5 sec	C 29.6 sec	A 4.2 sec
Lagoon Street	A 7.8 sec	A 7.7 sec	B 17.1 sec	B 13.3 sec	B 13.1 sec
200 East	C 26.0 sec	C 21.1 sec	A 8.7 sec	B 15.8 sec	B 17.4 sec
North 600 East	A 2.2 sec	A 2.9 sec	C 26.9 sec	C 26.9 sec	A 6.3 sec

**Table 2.4-11. Level of Service and Delay at Intersections on US 40 in Roosevelt in 2007 during the PM Peak Period**

Intersection	LOS and Seconds of Delay by Location				Overall Intersection LOS and Delay
	US 40		Cross Street		
	EB	WB	NB	SB	
State Street	A 2.5 sec	A 2.3 sec	C 30.4 sec	C 30.7 sec	A 5.7 sec
Lagoon Street	A 9.5 sec	A 9.5 sec	B 18.0 sec	B 18.3 sec	B 15.7 sec
200 East	C 33.1 sec	C 29.8 sec	C 24.8 sec	C 26.9 sec	C 28.5 sec
North 600 East	A 3.4 sec	A 3.5 sec	C 28.7 sec	C 28.8 sec	A 7.4 sec

**Table 2.4-12. Level of Service and Delay at Intersections on US 40 in Vernal in 2007 during the AM Peak Period**

Intersection	LOS and Seconds of Delay by Location				Overall Intersection LOS and Delay
	US 40		Cross Street		
	EB	WB	NB	SB	
100 South	B 19.3 sec	B 18.5 sec	E 56.5 sec	C 24.3 sec	C 27.2 sec
500 West	A 5.2 sec	A 2.6 sec	C 26.7 sec	C 30.3 sec	A 7.6 sec
100 West	A 1.1 sec	A 1.5 sec	C 34.9 sec	C 34.7 sec	A 3.6 sec
Route 191	A 3.5 sec	A 5.4 sec	C 24.1 sec	C 27.1 sec	B 10.2 sec
500 East	A 2.7 sec	A 3.0 sec	C 33.1 sec	C 33.5 sec	A 8.0 sec

**Table 2.4-13. Level of Service and Delay at Intersections on US 40 in Vernal in 2007 during the PM Peak Period**

Intersection	LOS and Seconds of Delay by Location				Overall Intersection LOS and Delay
	US 40		Cross Street		
	EB	WB	NB	SB	
100 South	C 34.0 sec	D 50.6 sec	E 86.7 sec	D 22.9 sec	D 46.2 sec
500 West	B 14.5 sec	D 38.5 sec	E 63.0 sec	D 35.4 sec	C 33.6 sec
100 West	A 1.2 sec	A 2.8 sec	D 44.2 sec	D 41.0 sec	A 5.7 sec
Route 191	F 164.8 sec	A 7.6 sec	F 112.8 sec	C 32.5 sec	E 74.1 sec
500 East	A 5.9 sec	B 11.3 sec	D 36.3 sec	D 46.2 sec	B 15.5 sec

### 2.4.5.2 Access Standards

Access standards and management greatly affect the safety and operation of rural highways such as US 40, especially where the highway intersects developed cities and towns. Table 2.4-14 below outlines UDOT's proposed statewide access management standards (these standards have not yet been finalized by UDOT). According to the access category inventory for UDOT Region 3, which includes



the US 40 corridor, most of the study corridor is classified as *System Priority Rural*. The classification changes briefly through the more urbanized areas of Duchesne, Myton, Roosevelt, and Vernal-Naples, as follows:

- Duchesne (all of Segment 3) and Roosevelt (in Segment 5): Regional Rural and Community Rural
- Myton (in Segment 4): Regional Rural
- Vernal and Naples (Segment 7): five different classifications depending on the location within the city, including Regional Rural, System Priority Urban, Regional Priority Urban, Regional Urban, and Community Rural

**Table 2.4-14. Proposed Standards for Access Management on State Highways**

Category		Minimum Signal Spacing (feet)	Minimum Street Spacing (feet)	Minimum Access Spacing (feet)	Minimum Interchange to Cross Road Access Spacing (feet)		
					Standard A: to 1st R-in R-out <sup>a</sup>	Standard B: to 1st Intersection <sup>b</sup>	Standard C: from Last R-in R-out <sup>c</sup>
1	Interstate/ Freeway	Freeway/Interstate Standards Apply					
2	System Priority Rural	5,280	1,000	1,000	1,320	1,320	1,320
3	System Priority Urban	2,640	No unsignalized access permitted		1,320	1,320	1,320
4	Regional Rural	2,640	660	500	660	1,320	500
5	Regional – Priority Urban	2,640	660	350	660	1,320	500
6	Regional Urban	1,320	350	200	500	1,320	500
7	Community Rural	1,320	300	150	NA	NA	NA
8	Community Urban	1,320	300	150	NA	NA	NA
9	Other	1,320	300	150	NA	NA	NA

Source: UDOT 2003

<sup>a</sup> Standard A refers to the distance from the interchange off ramp gore area to the first right-in/right-out driveway intersection.

<sup>b</sup> Standard B refers to the distance from the interchange off ramp gore area to the first major intersection.

<sup>c</sup> Standard C refers to the distance from the last right-in/right-out driveway intersection to the interchange on ramp gore area.

### 2.4.5.3 Accident History

The project team performed a complete analysis of existing crash data for the US 40 study corridor (HDR 2007c) by reviewing 5 years of crash data gathered by UDOT's Office of Traffic and Safety (UDOT 2007b). The findings of that analysis are as follows:

- **Number of Crashes:** The number of crashes has significantly increased since 2003 (that is, over the 2001 through 2003 numbers).
- **Crash Rate:** The crash rate was above the statewide average for rural highways for the last 3 years of the study.
- **Roadway Surface Conditions:** The majority of the crashes (84%) occurred on a dry road surface.
- **Contributing Factors:** The three main contributing circumstances in all crashes were failure to yield right-of-way (16%), improper lookout (15%), and maintaining too fast a speed (15%). For fatal crashes, excessive speed (17%) and failure to yield (11%) were the most common contributing circumstances.
- **Crash Type:** Collision with a moving vehicle was the most frequent crash type, or occurrence (40%). Collision with a moving vehicle was also the most frequent fatal crash occurrence (73%).
- **Wildlife Strikes:** Wild animals were involved in 32% of crashes in the study corridor. According to available data, wild-animal-related incidents were not clustered in one particular area, but occurred throughout the corridor. However, local residents reported concentrations in Daniels Canyon, near Strawberry Reservoir, and near Starvation Reservoir (west of Duchesne). The actual number of these types of accidents could be higher since many collisions involving motor vehicles and wild animals are not reported.
- **Intersections:** One out of every four crashes was at an intersection or was intersection-related.

For complete information about the accident history of the corridor, see the *US 40 Corridor Study Crash History and Analysis* (HDR 2007c).

### 2.4.5.4 Use of US 40 by the Oil and Gas Industry

UDOT recognizes that the changing traffic conditions related to increased truck traffic from oil and gas development in the Uintah Basin are one of the most



significant considerations along the US 40 corridor. The US 40 Corridor Study included a close look at the use of the corridor by the oil and gas industry and documented some of the findings in a report titled *Oil and Gas Truck Traffic Impacts on US 40 Corridor, Utah, in Support of the US 40 Corridor Study* (HDR 2007d). The corridor study also considered other recent investigations by UDOT, including the report *Highway Freight Traffic Associated with the Development of Oil and Gas Wells* (Kuhn 2006).

Changing traffic conditions have caused the operation of this section of US 40 to deteriorate. Increased truck and overall traffic volumes have resulted in highway capacity deficiencies, mostly due to the geographical features of the roadway, safety issues, and the degraded condition of the highway surface.

Overall, the number of average daily truck trips associated with establishing oil and gas wells is about 8,000 truck trips per day along this section of US 40 (HDR 2007d). Steep grades slow down heavy trucks and the traffic behind them, and there is often no passing lane to allow lighter vehicles to safely pass the trucks. In some locations, there is a steep grade where trucks enter the flow of traffic, which causes major bottlenecks. This is the case at the intersection of US 40 and SR 88, where traffic traveling at 65 mph is interrupted by trucks entering the highway up a steep grade. Trucks at these types of locations are often moving at “crawl” speeds as they climb the hill. When other drivers approach these trucks, they must slow down suddenly, which causes dangerous driving conditions. The general lack of passing lanes along US 40 is a particular problem in locations with heavy truck traffic.

In addition to traffic flow issues on the US 40 mainline, the increased truck traffic has caused problems in the cities along the corridor. Truck traffic has caused road damage, especially where trucks must stop for traffic signals; interruptions in the traffic flow at intersections because trucks must swing out into adjacent lanes to make the turn; and general incompatibilities because residents feel overwhelmed by the noise and operation of large trucks through downtown areas.

#### **2.4.6 Bicycle and Pedestrian Facilities**

Due to its rural nature, US 40 does not have formal bicycle lanes or bikeways. The project segments that pass through more urbanized areas have sections of sidewalk available for pedestrian use. Bicycle use of roadway shoulders and crossings is also more prevalent in these areas. Segment 5, which includes Roosevelt and Ballard, is crossed by a “greenbelt” (trail corridor) that is used by cyclists and pedestrians.



Recreational cyclists ride along the shoulders of US 40, often for long distances. According to the Utah Bicycle Suitability Map (UDOT 2004b), most sections of the highway outside of city limits have a shoulder width of more than 4 feet. There are 2-to-4-foot-wide shoulders near Strawberry Reservoir, at the intersection of US 40 and SR 208 (about MP 68), and between Naples and Jensen. The map shows the areas of Daniels Summit and the city of Vernal as having shoulders less than 2 feet wide. Despite these deficiencies, the rates of bicycle/motor vehicle crashes on US 40 in all three counties along the corridor are lower than the state average (see Table 2.4-15).

**Table 2.4-15. Crashes Involving Bicycles, Pedestrians, and Motor Vehicles on US 40 in the Study Corridor, 1995–2004**

Area	Rate <sup>a</sup>	Statewide Ranking
<i>Bicycle/Motor Vehicle Crashes</i>		
Utah	39.15	NA
Wasatch County	23.30	9
Duchesne County	13.21	22
Uintah County	21.33	14
<i>Pedestrian/Motor Vehicle Crashes</i>		
Utah	48.24	NA
Wasatch County	27.18	14
Duchesne County	26.86	15
Uintah County	25.73	17

Source: Utah Department of Health 2006

<sup>a</sup> Rate is number of crashes per 100,000 people.

## 2.5 Transportation Plans That Apply to the Study Corridor

Transportation plans that apply to US 40 within the study corridor range from formal plans adopted at the state level by the Transportation Commission to local plans established to help provide future direction as communities grow. Table 2.5-1 below summarizes the plans that identify projects along or management authority for land adjacent to the study corridor. Details about each plan are presented in the *Existing Facility Conditions Report in Support of the US 40 Corridor Study* (HDR 2007b).

**Table 2.5-1. Summary of Improvements to US 40 in Various Transportation Plans**

Plan Administrator	Plan Name	Summary
UDOT	Statewide Transportation Plan – Long-Range Transportation Plan 2007–2030 (adopted June 2007)	<p>Plan that covers rural and small urban areas in Utah as well as U.S. highways such as US 40. Updated every 4 years. Current plan includes the following projects on US 40:</p> <ul style="list-style-type: none"> <li>• Widen US 40 from SR 189 (Heber City) to Daniels Road (mouth of canyon).</li> <li>• Widen SR 121 from US 40 to SR 121 MP 5 in Roosevelt.</li> <li>• Widen US 40 from Vernal to SR 149 in Jensen.</li> </ul>
UDOT	Statewide Transportation Improvement Program 2007–2012 (adopted 2006; new version pending)	<p>Five-year plan of highway and transit projects for Utah, updated yearly. Currently includes the following projects on US 40:</p> <ul style="list-style-type: none"> <li>• Rotomill and overlay on US 40 from Clegg Canyon to Strawberry Valley.</li> <li>• Reconstruct asphalt pavement on US 40 from Daniels Summit to Strawberry Maintenance Station.</li> <li>• Rehabilitate the US 40 bridge over Starvation Reservoir.</li> <li>• Add passing lanes on US 40 between Duchesne and Roosevelt.</li> <li>• Widen US 40 from west Roosevelt to Ioka Junction (widen to three lanes).</li> <li>• Reconstruct intersection of US 40 and 500 South in Vernal for traffic signal.</li> <li>• Widen US 40 from east Roosevelt to Ballard eastern city limit (widen to three lanes).</li> <li>• Widen and add passing lanes on US 40 from the “Twists” to Vernal.</li> <li>• Highway beautification in Vernal.</li> </ul>
BLM	Western Regional Corridor Study (2005)	<p>Plan that identifies transportation corridors with the intention to show where BLM encourages the placement of utilities. Corridors are identified adjacent to US 40. US 40 projects in or near these corridors will require coordination with BLM.</p>
Bureau of Indian Affairs	Indian Reservation Roads Inventory (2006)	<p>Comprehensive road inventory of public roads located in, or that provide access to, an Indian reservation or Indian trust land; restricted Indian land that is not subject to fee title alienation without federal approval; and Indian or Alaska Native Villages, groups, or communities in which Indians and Alaska Natives reside and whom the Secretary of the Interior has determined are eligible for services generally available to Indians under federal laws specifically applicable to Indians. The inventory is prepared in support of the Bureau’s road funding program. The inventory outlines road classifications, traffic volumes, maintenance responsibility, and ownership.</p> <p>The Uintah-Ouray Indian Reservation Roads (IRR) Inventory does not provide specific information on the location of the 64 official IRR routes in Uintah and Duchesne Counties. Any work on US 40 on or near subject lands will require coordination with the Bureau and/or the Uintah-Ouray Tribal Government.</p>

**Table 2.5-1. Summary of Improvements to US 40 in Various Transportation Plans**

Plan Administrator	Plan Name	Summary
City of Duchesne	Duchesne City Community Transportation Plan (2005)	<p>Draft community plan that provides a summary of current and future project needs. Includes the following high-priority projects for US 40:</p> <ul style="list-style-type: none"> <li>• Complete signal warrant study for the intersection of US 40 and SR 87.</li> <li>• Complete speed study at entrances to the city on US 40.</li> <li>• Construct turn lane on US 40 at the east end of town.</li> </ul>
City of Roosevelt	Roosevelt City Transportation Master Plan (2005)	<p>Draft community plan that provides a summary of current and future project needs. Includes the following high-priority projects for US 40:</p> <ul style="list-style-type: none"> <li>• Replace Dry Gulch irrigation culvert under US 40.</li> <li>• Improve intersection of US 40 and SR 121.</li> <li>• Make improvements to Cottonwood Creek Bridge on US 40 to address four-lane to two-lane bottleneck.</li> <li>• Add sidewalk to Cottonwood Creek bridge over US 40.</li> </ul>
Uintah County	Uintah County General Plan (2005)	<p>General blueprint for future development in Uintah County. Plan includes policies that address general roadway development or coordination with UDOT (specifically, coordinating with UDOT during development of a master transportation plan and road maintenance plan).</p>
Town of Ballard	Ballard Town Community Transportation Plan (2005)	<p>Draft community plan that provides a summary of current and future project needs. Includes the following high-priority projects for US 40:</p> <ul style="list-style-type: none"> <li>• Widen US 40 from Ballard to Fort Duchesne.</li> <li>• Improve the intersection of US 40 and 3500 East (modify turn radii and add turn lanes).</li> </ul>
City of Vernal	Vernal City Transportation Master Plan (2004)	<p>Community plan that provides a summary of current and future project needs. Includes the following high-priority projects for US 40:</p> <ul style="list-style-type: none"> <li>• Improve intersection of US 40 and 1000 South (west side).</li> <li>• Improve intersection of US 40 and 100 South.</li> <li>• Improve intersection of US 40 and 500 East.</li> <li>• Improve intersection of US 40 and 500 South (east side).</li> </ul>
City of Naples	Naples Transportation Plan (2006)	<p>Community plan that provides a summary of current and future project needs. Includes the following high-priority projects for US 40:</p> <ul style="list-style-type: none"> <li>• Widen US 40 from Roosevelt to Vernal.</li> <li>• Realign the US 40/SR 45 intersection.</li> <li>• Improve intersection of US 40 and 1500 South.</li> <li>• Improve intersection of US 40 and 500 South.</li> <li>• Complete signal warrant studies for the intersections of US 40 and 500 South and US 40 and 1500 South.</li> </ul>

Source: HDR 2007b



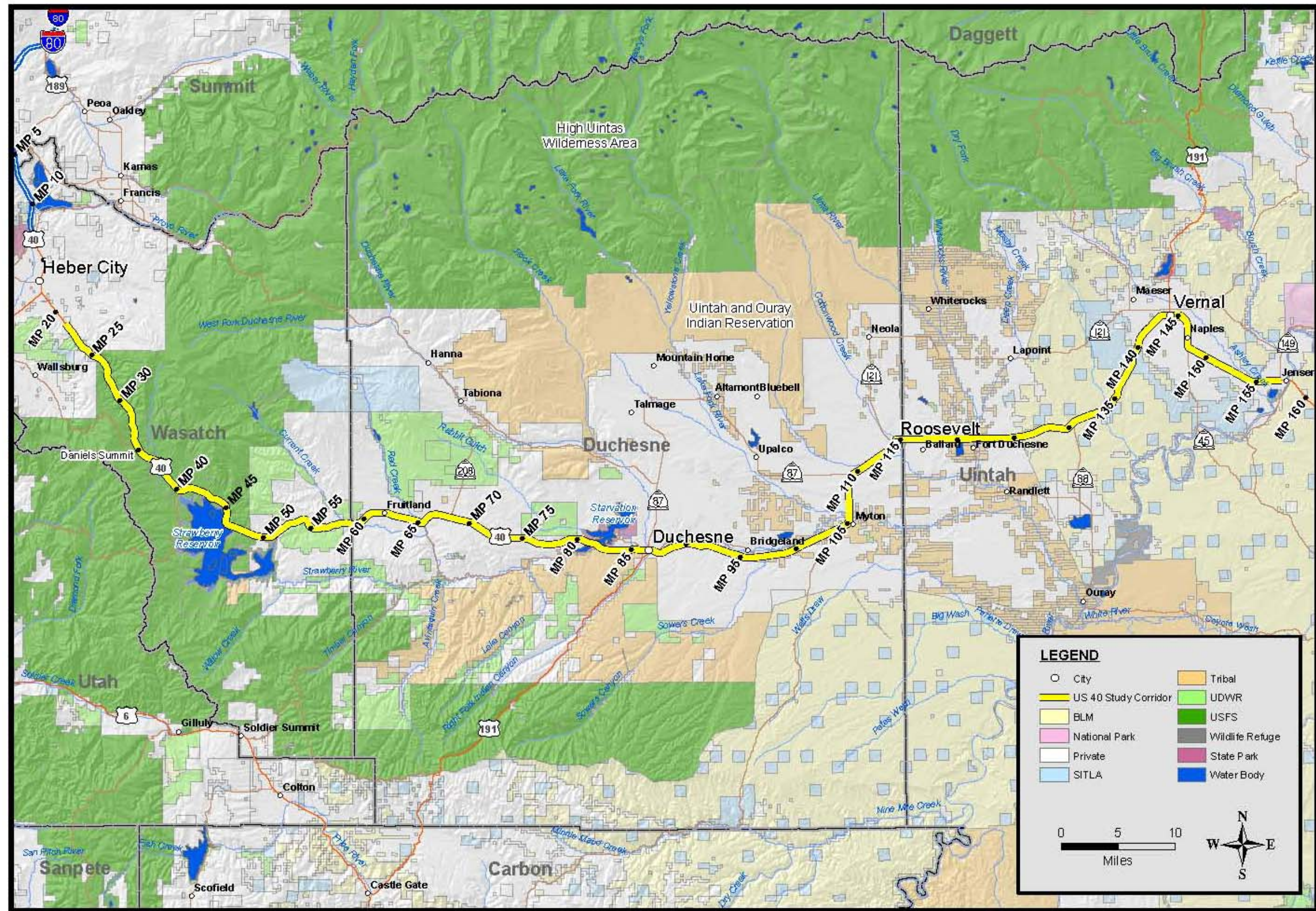


Figure 2-1. Land Ownership



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